

CHARGE NUMBER: 2308  
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PROJECT LEADER: A. G. KALLIANOS  
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## I. Sidestream Smoke Studies

### OBJECTIVES:

1. Identify undesirable components in sidestream smoke and effect compositional changes to reduce them.
2. Develop the technology to reduce quantity or visibility of sidestream smoke.
3. Develop the technology to reduce or mask objectionable odor of sidestream smoke.

### STATUS:

#### A. Sensory evaluation of sidestream smoke (B. Demian)

1. The descriptive sensory data for the full-flavor group of the twenty-seven commercial brands selected for study were statistically analyzed with the assistance of Analytical Research personnel (M. Jeltma and B. Good). Analysis of variance is showing that the panelists are consistent in their ratings, but there are differences in discriminative powers. The panel as a whole can distinguish between the ten "full-flavor" brands on basis of sidestream smoke odor, i.e. "ammonia", "pyrazine", and to some extent "smoky" attributes. Higher than average ratings on these three descriptors were obtained for the control A cigarette, manufactured from a commercial blend of tobaccos. Raleigh, Viceroy, and Control C were judged lower than average in "pyrazine" notes. Pall Mall sidestream smoke is much higher in "smoky" character.
2. We are currently in the process of evaluating the seven brands of commercial cigarettes grouped in the "Lights" category. Initial screening for differences is being conducted with triangle tests.
3. A competitor test cigarette, being sampled in a Mall study with some questions relating to sidestream smoke, was evaluated in a descriptive analysis by our sidestream smoke panel. The test cigarette is mentholated and is fabricated with a high citrate double wrapper. The panel found it to be very high in smoky-burnt attributes and very harsh. Same attributes but of smaller amplitude were observed for a high citrate, non-porous wrapper experimental cigarette.
4. The sidestream smoke evaluation apparatus is now fitted for sample collection and awaiting test results from Analytical Research personnel on the "Chrompak".

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thermal desorption-Cryogenic trapping unit.

B. Control of sidestream smoke

1. Cigarettes of a commercial brand extracted with a variety of solvents have been submitted to descriptive sensory analysis of sidestream smoke. The most characteristic change observed in extracted cigarettes is an increase in "smoky" and "burnt" attributes, and this increase parallels the weight change after extraction. The higher the weight change, the higher the smoky-burnt character.
2. Exploratory work to modify the odor of sidestream smoke has been continued. An alcoholic extract of tarragon was found to increase the "sweet" character of sidestream smoke.
3. Experiments to mask/neutralize the butt aroma of cigarettes have involved a variety of masking flavorants and odor control chemicals. Volatile acids and alcohols appear promising.

II. Burley Tobacco Character (with H. Lanzillotti)

OBJECTIVE:

Explore the development of burley tobacco character on RL.

Our approach in meeting this objective is based on oxidative and deaminative reactions that appear to take place in burley tobacco during the air-curing process. Initial experiments have focused on the oxidative reactions and these are being explored through ortho-quinone formation of polyphenols and oxidation of ascorbic acid. Both of these appear promising in developing desirable aroma and flavor on RL. Our experiments with oxidized ascorbic acid, however, produced conflicting results based on expectations from a large body of literature on the structure of dehydroascorbic acid.  $C^{13}$ -NMR spectra by Dr. Richard Cox confirmed our observations and are helping our better understanding of the reactions involved.

Experiments to resolve conflicting information through study of derivatives are in progress, as are also experiments to optimize formation of flavor intermediates and use levels on RL as well as on tobacco blends.

III. References

1. A. G. Kallianos, Notebook #7619
2. B. Demian, Notebook #7849
3. H. V. Lanzillotti, Notebook #7709

  
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